NEW CLAIMS

18. A comminution machine (1) for comminuting soft to medium hard comminution material (2), the comminution machine comprising:

a machine housing (3);

a feed channel (13) and a removal channel (14) connected to the machine housing (3);

a closed working cylinder (4), having comminution holes (5) and comprised of material with inherent stiffness, arranged in the machine housing (3);

a shaft (7) coaxially arranged to the working cylinder (4),

tools (6) mounted on the shaft (7) and rotating relative to the working cylinder;

wherein the tools (6) have vanes (9) revolving at a spacing (10) of at most a diameter of the comminution holes (5) practically contactless relative to the working cylinder (4);

wherein the vanes (9) have outer edges (11) slanted counter to a relative rotational direction (33; 34) between the working cylinder (4) and the tools (6);

wherein an orientation (15) of the shaft (7) and an axial orientation (15) of the working cylinder (4) deviate from a vertical line (16);

wherein the working cylinder (4) has a first end face opening (17) connected to the feed channel (13);

wherein the working cylinder (4) has a lower cylinder half (20) connected to the removal channel (14);

wherein the working cylinder (4) has a second end face opening (21) closed by a freely accessible lid (22), wherein the diameter (23) of the second end face opening (21) is at least as large as the greatest diameter (24) of the working cylinder (4);

wherein the shaft (7) extends from the feed channel (13) to the lid (22) at most to an inner wall (25) of the lid (22) but does not penetrate the lid (22).

19. The comminution machine according to claim 18, wherein the working cylinder (4) has a first end and a second end, wherein the first end of the working cylinder (4) is centered in the machine housing (3) in the area of an inlet opening of the feed channel (13) and wherein the second end of the working cylinder (4) is centered in the lid (22), wherein the lid (22) axially secures the working cylinder (4).

20. The comminution machine according to claim 19, wherein the working cylinder (4) is immobile during comminution and configured to be fixed in several rotational positions.

21. The comminution machine according to claim 20, further comprising centering devices (27, 28), wherein the first and second end faces of the working cylinder (4) are clamped over the entire periphery of the first and second end faces by the centering devices (27, 28).

22. The comminution machine according to claim 21, wherein the centering devices (27, 28) are rotatably (29, 30) supported and the working cylinder (4) has an external rotary drive (31) which engages the working cylinder (4) without interfering with a mountability of the lid (22).

23. The comminution machine according to claim 22, wherein the tools (6) are

stationary and immobile during comminution and the working cylinder (4) is rotatingly driven relative to the tools (6).

24. The comminution machine according to claim 22, wherein the working cylinder (4) and the tools (6) are driven (31, 32) independently and in opposite directions relative to one another (33, 34).

25. The comminution machine according to claim 18, wherein the working cylinder (4) is stationary and immobile during comminution and the tools (6) are driven in rotation (32).

26. The comminution machine according claim 18, wherein the shaft (7) penetrates the feed channel (13) and is free of shaft steps in the feed channel (13).

27. The comminution machine according to claim 26, further comprising a separate rotor (8), wherein the tools (6) are seated on a periphery of the separate rotor (8), wherein the separate rotor (8) is fixedly connected by a feather key (35) to the shaft (7) for torque transmission.

28. The comminution machine according to claim 26, wherein the shaft (7) is supported outside of the feed channel (13) in a floating arrangement.

29. The comminution machine according claim 18, wherein the lid (22) is connected (26) with one end face (38) flat against a counter surface of the machine frame (3) by a screw connection.

30. The comminution machine according to claim 29, wherein the tools (6) have first transverse edges (36) positioned on an inner side of the lid (22), wherein the first transverse edges (36) rotate across the inner side at a spacing as minimal as possible

relative to the inner side of the lid (22) without contacting the inner side.

31. The comminution machine according to claim 30, wherein the machine housing (3) has a flat housing wall (39) on a side of the machine housing (3) opposite the lid (22), wherein the tools (6) have second transverse edges (37) positioned on the flat housing wall (39), wherein the second transverse edges (37) rotate at a spacing as minimal as possible to the flat housing wall (39) without contacting the flat housing wall (39).

32. The comminution machine according claim 18, wherein the working cylinder (4) is straight-cylindrical and the orientation of the shaft (7) and the axial orientation of the working cylinder (4) are horizontal.

33. The comminution machine according claim 18, wherein the working cylinder (4) is conical.

34. The comminution machine according to claim 33, wherein a lower surface line (40) of the working cylinder is positioned relative to a horizontal line at an angle between zero degrees and approximately 30 degrees.